AN EXAMINATION OF HOW ATTENTION INFLUENCES EXPOSURE EFFECTS: TARGET SELECTION, DISTRACTOR DEVALUATION AND MERE EXPOSURE

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ABSTRACT

There is an old market saying, every exposure is good exposure. However, when consumers are involved in a search activity that requires selective attention, for stimuli that are not targets (distractors), the positive mere exposure effect may be eliminated. The study examined the relationship between attention and exposure effects under three situations, mere exposure, target selection and distractor devaluation. Attitude towards the brand was measured as the dependent variable.

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CHAPTER 1

INTRODUCTION

There is an old marketing saying that any exposure is good exposure. But could any advertising exposure be good, even when people avoid advertisements, dismissing them as something distracting? The exposure of stimuli may lead not only to cognitive outcomes, such as awareness or memory, but also to affective outcomes, positive or negative. On the positive side, there is the *mere exposure effect* (MEE). Mere exposure is a well-known psychological phenomenon where increased positive ratings of stimuli can be generated simply by repeated exposure of them (Zajonc, 1968). Mere exposure has often been applied to the advertising industry, which aims to improve consumers' affective response towards products and brands (Janiszewski, 1993; Grimes & Kitchen, 2007). However, a negative effect of exposure has also been found when exposed stimuli are considered as distractors. Raymond et al. (2003) first addressed this phenomenon as *distractor devaluation*. In their research, participants were asked to select a target stimulus as quickly as possible from two presented stimuli. The results showed that non-target stimuli (distractors) were later rated lower than target stimuli and novel stimuli.

It would seem that mere exposure and distractor devaluation are exposure effects that contradict each other. The contradiction remains problematic in terms of the application of a psychological framework of exposure to advertising. Research that evaluates both positive and negative exposure effects at the same time is lacking. This thesis aims to fill that gap by examining the three types of exposure: target exposure (stimuli are the goal of attention);

mere exposure (stimuli are merely exposed without any goal-directed selection or ignoring actions); and distractor exposure (stimuli are to-be-ignored items).

When people attend to a specific target, the target stimulus receives selective attention, a high level of attention. Selective attention can be considered as a result of the top-down process. Top-down processing occurs when attention is voluntarily directed to objects of current importance to the viewer (Connor et al., 2004). At the same time, the neglected visuals receive inhibitory attention. Inhibitory attention could be seen as paying attention away from, rather than to, an object. For example, when someone goes to Walmart with a shopping list in hand and needs to select an unknown brand of cereal from the shelf that his roommate asked for, he focuses his attention on finding the target product, hoping to finish shopping as quickly as possible. In this situation, the selected cereal is a target in the top-down process and receives selective attention. Meanwhile, the ignored boxes placed near the target on the shelf are likely to receive distractor exposure, since they are given inhibitory attention as non-target cereals.

Unlike in selective attention, in the case of mere exposure, there is no prior goal involved. Attention is less focused on a specific item but diffused to more items in the visual field; thus, it is less strong than selective attention. Since there is no target involved, the visual stimuli all have an opportunity to be attended to. Now assume that an exchange student is in that same cereal aisle and has no idea of which brand to select. She might look around at all of the cereal options in order to assess each option before choosing. In this case, exposed cereals are all assumed to receive mere exposure.

Based on the preceding discussion, it can be concluded that the exposure-affect relationship is not always positive. How an ad or brand is exposed can further influence consumers' perception, attitude, and purchase intention (Schwartz, 1969). It would be useful for advertising professionals to identify the boundary between the effects of positive and negative exposure. In this thesis, I will review literature related to mere exposure, target selection, and distractor devaluation, investigating the theoretical development of each branch and the limitations of possible explanations. The goal of this study is to provide a uniform framework of the exposure-affect relationship in the context of consumer choice.

CHAPTER 2

LITERATURE REVIEW

2.1 Mere Exposure Effect

Since the first publication detailing the mere exposure effect (MEE), Zajonc's *Attitudinal Effects of Mere Exposure* published in 1968, the topic has gained a great amount of attention from psychological scholars. Zajonc (1968) defined the mere exposure effect as when the "mere repeated exposure of a stimulus to the individual is a sufficient condition for the enhancement of his attitude towards it." In his research, Zajonc (1968) used Turkish nonsense words, Chinese ideographs, and photographs of students as stimuli. The exposures of stimuli ranged from 0 to 25. For Turkish nonsense words and Chinese ideographs, a positive correlation was found between the number of exposures and the goodness of meaning. There was also a positive relationship found between frequency of exposure and liking ratings.

A meta-analysis of studies on the MEE from 1968–1987 summarised various aspects that were found to influence the magnitude of the exposure effect, including stimulus type, complexity, presentation sequence, exposure duration, recognition, age of subject, delay between exposure and ratings, and maximum number of stimulus presentations (Bornstein, 1989). The exposure effect is enhanced with brief exposure durations (usually 1–5 seconds). A heterogeneous exposure sequence produces slightly stronger exposure effects than a homogenous exposure sequence. A period of delay between stimulus exposures and ratings results in stronger exposure effects. Complex stimuli may elicit a more positive mere exposure effect than simple stimuli. However, studies of the MEE in children suggest that

children prefer novel stimuli to familiar stimuli (Bornstein, 1989). According to Bornstein (1989), mere exposure is a robust effect that was investigated in both laboratory and naturalistic studies and examined in a wide range of topics, including advertising effects (Sawyer, 1981); children's reactions to novel stimuli (Hutt, 1975); subliminal influences on behaviour (Bornstein, Leone, & Galley, 1987); social perceptions (Saegert, Swap, & Zajonc, 1973); environmental preferences (Herzog, Kaplan, & Kaplan, 1976); and verbal learning (Grush, 1976).

There are competing models to explain the mere exposure effect. Four different models, namely the two-factor model, the perceptual fluency/attributional model, the hedonic fluency model, and the conditioning explanation, will be reviewed as follows.

The two-factor model. Berlyne (1970) and Stang (1973, 1975) considered the MEE in two respects: stimulus habituation and boredom. As a stimulus was repeated, it became familiar and no longer threatening to observers. Thus, stimulus habituation could elicit a positive affective response. However, boredom occurred as a result of overexposure and could even lead to wear-out effects. An inverted-U relationship between repetition and exposure effects was thus suggested. Initially, repeated exposure increased liking towards the stimulus; however, boredom or satiation developed afterwards, and repetitions ultimately led to negative affect towards the stimulus (Berlyne, 1970; Stang, 1973, 1975). According to a meta-analysis of mere exposure, enhanced evaluation reached an apex when the number of repetitions fell somewhere between 10 and 20 (Bornstein, 1989).

The boredom factor emphasized in the two-factor model was consistent with MEE findings, such as longer exposure durations produce greater boredom – and, therefore, a weaker exposure effect – than brief exposure durations. Further, it was found that a homogeneous exposure sequence led to greater boredom than a heterogeneous exposure sequence, and that simple stimuli produced greater boredom than complex stimuli (Bornstein, 1989). However, the stimulus habituation study failed to explain why the MEE could also occur at a subliminal level. The model indicated subjective familiarity and stimulus recognition as key factors that led to positive affect. In contrast, Bornstein et al. (1987) demonstrated that stimulus recognition was not a prerequisite for positive exposure effects; moreover, compared to recognizable stimuli, exposure to subliminal stimuli resulted in greater attitude enhancement (Bornstein, 1989).

The perceptual fluency/attributional model. Bornstein and D'Agostino (1992) found a stronger exposure effect for subliminal stimuli than for stimuli that were clearly recognized. To explain this pattern of results, Bornstein and D'Agostino (1992) suggested the perceptual fluency/attributional model. It was assumed that subjects misattributed fluency, resulting from repeated exposure, to liking for a stimulus in the subliminal exposure condition. However, subjects might revise their initial positive interpretation of fluency effects once they were aware of the presence of the stimulus (Bornstein & D'Agostino, 1992). The model indicated that inferences or metacognition generated by a repeated exposure experience could increase recognition and familiarity, which played a role in misattributing the positive response to the stimulus (Bornstein & D'Agostino, 1994).

The perceptual fluency/attributional explanation is a cognitive-based model, which requires participants' automatic cognitive processes to correct their misattribution of liking (Fang, Singh, & Ahluwalia, 2007). However, the answer remains unclear as to why subjects were motivated to "correct" their positive ratings automatically for clearly recognized stimuli in mere exposure experiments (Bornstein & D'Agostino, 1994). It also remains unknown whether the subjects realized that they misattributed stimulus familiarity to liking.

The hedonic fluency model. The hedonic fluency model proposed that processing facilitation itself elicits a genuine affective reaction and that the affective reaction was hedonically positive (Winkielman & Cacioppo, 2001). Winkielman and Cacioppo (2001) demonstrated the relation between facilitation of stimulus processing and a brief, mild, positive affective response using facial electromyography (EMG) as a measure. The model emphasized the hedonic affect-based characteristic of the fluency signal but did not define whether the positive evaluation occurred within the cognitive system or not. Affect was seen as information in a way that subjects inferred their evaluations from how they felt (affective) rather than why they felt (cognitive) (Schwarz & Clore, 1983). In contrast to the perceptual fluency/attributional model, Lee (2001) suggested that participants would not be likely to correct their affective judgments (for example, liking) when they became aware of the source of perceptual fluency (for example, repetitions). Zajonc (2001) pointed out that affect could be elicited without a prior cognitive appraisal using Elliott and Dolan's (1998) findings as neuroanatomical evidence, that is, explicit recognition and preference were associated with separate brain structures: recognition judgements were associated with the frontopolar cortex

and the parietal areas, while preference reactions were connected with the right lateral frontal activation.

Conditioning explanation. Zajonc (2001) provided a conditioning explanation for the mere exposure effect. He considered the exposed stimulus as a conditioned stimulus (CS), the absence of aversive events as an unconditioned stimulus (US), and an approach tendency as an unconditioned response. According to classical conditioning, a US could elicit a certain unconditioned response (UR), and after several CS-US occurrences, the conditioned stimulus (CS) alone could lead to the same response. As for mere exposure, the absence of aversive events (US) could trigger the approach tendency (UR), and if the stimulus was repeated several times with the US, the approach tendency towards the stimulus could be enhanced and, thus, lead to a positive preference response.

According to the conditioning explanation, the prerequisite for the mere exposure effect is the absence of negative associations. In the study, both avoidance and approach responses were elicited to a novel stimulus at the beginning, but instances of avoidance and escape reduced after several repetitions, leaving only an approach response (Zajonc, 2001). In the case of distractor devaluation, the stimulus actually elicits participants' inhibition – an avoidance response. The avoidance response may have been enhanced by repetitions, but the approach response vanished. The stimulus would have to receive negative associations because of the avoidance response.

Compared to the other models, the conditioning explanation emphasizes a prerequisite of mere exposure: the absence of negative associations. In the current study, the conditioning

explanation has been used to guide the assumptions and distinguish between mere exposure and distractor devaluation.

2.2 Distractor Exposure

In contrast to the mere exposure effect, the negative exposure effect (distractor devaluation) has been found in goal-oriented environments. An inhibited object (distractor) can result in a negative attitude. In an initial distractor devaluation study (Raymond, Fenske, & Tavassoli, 2003), participants were asked to perform a visual task, selecting the target from two presented stimuli in each trial. After the visual task, participants evaluated the attended stimuli (targets), ignored stimuli (distractors), and novel stimuli (which did not appear in the task). The ignored stimuli were rated lower than attended stimuli and novel stimuli (Raymond, Fenske, & Tavassoli, 2003).

An attentional inhibition account is most commonly used to explain distractor devaluation. Attentional inhibition occurs when a non-attended stimulus (distractor) competes for control over response against a target. Attentional inhibition is applied and stored with the mental representation of that stimulus; when the previously ignored stimulus is encountered again, the inhibition is reinstated and leads to affective devaluation of the distractor (Raymond et al., 2003; Fenske & Raymond, 2006). Compared to the conditioning explanation of mere exposure, which requires the absence of aversive events as a prerequisite, the inhibition devaluation account implies that it is aversive associations elicited by attentional inhibition that promote subsequent avoidance towards previously distracting

stimuli (Fenske & Raymond, 2006). The inhibition of a distractor could be seen as an avoidance response, which could be associated with an aversive state, and make the prerequisite of the MEE unavailable. Additionally, Kiss et al. (2007) investigated the relationship between attention and devaluation using EEG. Kiss et al. (2007) found that the evaluation of distractor faces (but not target faces) covaried with selective attention. When attention was more strongly biased towards the targets and the distractors were more effectively inhibited, the distractors were judged more negatively.

The stimuli used in distractor devaluation experiments were first meaningless patterns, such as circles, squares, and other polygons (Raymond, Fenske, & Tavassoli, 2003; Fenske, Raymond, & Kunar, 2004). Raymond et al. (2005) also used faces as stimuli, taken from a college yearbook. Some studies have also examined distractor devaluation in an advertising context using ads or product images as stimuli (Duff & Faber, 2011; Phuc, 2011). Similar to the MEE, distractor devaluation could also occur in the absence of explicit recall of to-be-rated stimuli (Martiny-Huenger, Gollwitzer, & Oettingen, 2014; Duff & Faber, 2011). There are also studies investigating different elements that moderate the effects of distractor devaluation. Raymond et al. (2005) found that the proximity of a distractor to a target enhanced distractor devaluation. Duff and Faber (2011) examined the influence of target-distractor similarity, task difficulty, and target-distractor distance on devaluation. They found that visual similarity between target and distractor, a more difficult task, and a closer target-distractor distance led to an increased distractor devaluation effect. Fenske and Raymond (2006) pointed out that devaluation increased with the amount of inhibition that

was directed to a stimulus.

2.3 Target Exposure

People consider non-targets as distractors when they focus their attention on a target. When there is distractor exposure, there should be target exposure. The target here is considered to be a visual stimulus that receives selective attention. If a person has a goal in mind, for example, to find a certain brand of milk among various choices while following a shopping list, then selective attention is paid to the goal-related object – in this case, the target brand of milk. Those various non-target brand choices (other brands of milk) might be viewed as distractors.

Janiszewski, Kuo, and Tavassoli (2012) examined the influence of selective attention and inattention to products on subsequent choice. Their research found that repeatedly allocating attention to a product (selective attention) could increase the likelihood that the product would be selected in a subsequent choice. The result showed a strong positive influence of selective attention on subsequent affective behaviour.

The biased competition model of attention was suggested to illustrate the above-mentioned finding. The visual cortex has limited capacity to process information at any instant, and the enhancement and inhibition of neural firing rates can be seen as an evolutionary adaptation to direct attention to the visuals that are most relevant to the ongoing behaviours (Janiszewski, Kuo, & Tavassoli, 2012). According to Reynolds and Chelazzi (2004), selective attention is localized to certain stimuli in a display because of an increased

firing rate of the visual cortex neurons, which are associated with the target stimulus, while at the same time there is a decreased firing rate for the non-target stimulus. Ungerleider et al. (2000) also mentioned that neural excitation corresponds to visual information in a target location while neural inhibition corresponds to information in other visual locations. Furthermore, neural enhancement and inhibition can be learned by the attentional system, and consequently, previously selected stimuli are more likely to be attended to when they are encountered at a later time (Desimone & Duncan, 1995; O'Craven et al., 1999). In the biased competition model, the effects of neural enhancement and inhibition are stronger when there is greater visual competition, since stronger selective attention is required to isolate the target from the distractor (Janiszewski, Kuo, & Tavassoli, 2012).

According to Janiszewski et al. (2012), selective attention and inattention could influence the subsequent choice towards previously selected and neglected products. They asked participants to choose between a non-exposed product and a previously selected or ignored product. In comparison with a non-exposed product, a previously selected product was chosen more, while a previously neglected one was chosen less. In the current study, I assume that attended stimuli (targets) will later receive positive ratings while neglected stimuli (distractors) will receive negative ratings.

2.4 Attention and Exposure Effects

The hierarchy of effects in advertising indicates that there are several stages between advertising exposure and the ultimate purchase of a product/brand: exposure, attention,

retention, attitude change, and purchase (Schwartz, 1969). During exposure, the advertising message must attract attention in some way to further change consumers' attitudes towards the product/brand (Schwartz, 1969). The level of attention paid to visual stimuli could activate different response systems. I assume attention is a key factor that results in attitude change in opposite directions. If a stimulus is attended to, whether actively (target selection) or passively (mere exposure), a positive preference is expected. However, if a stimulus is attentionally inhibited (distractor exposure), a negative response could be elicited.

Tavassoli (2008) considered different exposure effects as occurring in a single framework. According to Tavassoli, selecting, ignoring, and merely perceiving represent three parallel streams of a single stimulus-processing system. Selecting could be referred to as target selection, ignoring could be associated with distractor ignoring, and merely perceiving could be related to mere exposure. However, the framework remains untested about how these three parallel streams operate. In terms of attention, there is some research in marketing and advertising, for example, by Pieters and Wedel (2004) and Rosbergen, Pieters, and Wedel (1997), examining how physical properties of advertisements such as the brand, pictorial, and text size influence attention capture and transfer. However, literature on mere exposure contains little examination of the influence of attention on ad or product elements. The phenomena of target or distractor exposures are illustrated by the selective attention or the attentional inhibition accounts. In order to compare and explain the seemingly opposite exposure effects (negative/positive) under the same framework, it is necessary to further investigate the relationship between attention and the affective response.

Target selection requires selective attention, which can be considered as a result of a top-down process. Top-down processing occurs when attention is voluntarily directed to objects of current importance to the viewer (Connor et al., 2004). In other words, when people have a goal in mind, they selectively attend to their visual environment, for example, finding specific information online. Top-down attention is also called goal-driven attention. Pieters and Wedel (2007) examined goal control of attention to advertising using an eye-tracking method. They manipulated five goal conditions: 1) a free-viewing condition; 2) ad memorization, which asked subjects to memorize ads; 3) ad appreciation, which asked subjects to evaluate the attractiveness of the ads; 4) brand learning, which asked subjects to collect information about brands; and 5) brand evaluation. They found that different goals could result in attention transfer, for example, an ad-memorization goal enhanced attention to the overall advertisement, while a brand-learning goal enhanced attention to the body text but inhibited attention to the pictorial design (Pieters & Wedel, 2007). The current study uses goal control to manipulate attention through two conditions: a free-browsing condition, in which participants were asked to view displayed products freely; and a goal-directed condition, in which participants were asked to search for a target product. Stimuli were assumed to receive different types of attention accordingly.

2.5 Hypotheses

According to Tavassoli, selecting, ignoring, and merely perceiving represent three parallel streams of a single stimulus processing system. However, I consider the three

exposure effects in a continuum. It is assumed that the more the attention paid, the more positive the effect would be. Distractor devaluation is in the lower end of the continuum, since the stimulus receives inhibited attention. Target selection is supposed to be in the higher end of the continuum, since the stimulus receives a high level of attention – selective attention. Mere exposure should be in the middle of the continuum, since the stimulus receives diffused attention, which is less focused than selective attention but much stronger than inhibitive attention. According to Zajonc (1968), mere repeated exposure of a stimulus to the individual can enhance their attitude towards it.

H1: *Brands will be rated more positively in a mere-exposed situation compared to when they are novel.*

In a goal-oriented environment, a non-attended stimulus (distractor) will receive attentional inhibition. When the stimulus is encountered again, the inhibition is reinstated and leads to affective devaluation towards the distractor (Raymond et al., 2003; Fenske & Raymond, 2006).

H2*: Brands will be rated more negatively when they are the distractors (not the target), compared to when they are the novel stimuli, in a goal-directed search.*

Mere-exposed stimuli are assumed to receive positive ratings, while distractors are assumed to receive negative ratings.

H3*: Brands will be rated more negatively when they are the distractors (not the target) in a goal-directed search compared to when they are in a mere-exposed situation.*

In a goal-oriented environment, a target will receive selective attention. Selective attention can lead to positive responses towards the target (Janiszewski, Kuo, & Tavassoli, 2012).

H4*: Brands will be rated more positively when they are the target compared to when they are novel.*

Targets are assumed to receive positive ratings, while distractors are assumed to receive negative ratings.

H5*: Brands will be rated more positively when they are the target compared to when they are the distractors (not the target) in a goal-directed search.*

It is assumed that the more the attention paid, the more positive the effect would be. In target selection, the stimulus receives selective attention. In mere exposure, the stimulus receives diffused attention, which is less focused than selective attention. Therefore, target selection will lead to a stronger exposure effect than the mere-exposure situation.

H6: *Brands will be rated more positively when they are the target in a goal-directed search, compared to when they are in a mere-exposed situation.*

CHAPTER 3

METHODOLOGY

3.1 Overview

In this online experiment, participants were randomly assigned to one of two visual tasks. The search group was instructed to find the location of a target product from mock shelf displays, with the target product receiving selected attention and ignored products being inhibited as distractors. Participants in the browse group were asked to simply look at the products on a shelf display without any purpose. In this case, exposed products were expected to receive partial attention. After the task, emotion responses were measured in a questionnaire. Participants were then asked to rate their preference towards the target, distractors or mere-exposed products, and novel products. At the end of the questionnaire, questions assessing vision and colour blindness were asked in order to make sure participants included in the data analysis were eligible for the study, since otherwise the visual task performance may have been influenced. Gender and age details were also recorded.

3.2 Participants

Participants for both the pretest and the main experiment were recruited online through Amazon's Mechanical Turk (www.mturk.com). Mechanical Turk is an online marketplace where *workers* sign up to participate in online tasks in return for monetary compensation. Past research on Mechanical Turk has shown the credibility of using this online recruiting

platform. The data collected through Mechanical Turk are at least as reliable as those obtained via traditional methods, such as lab studies (Burhmester, Kwang, & Gosling, 2011).

A total of 34 participants were included in the pretest (13 males and 21 females), and 91 participants were included in the main experiment (44 males and 47 females). Participants in the pretest and the main study did not overlap. Participants who completed either task, and successfully, had their work approved and received a small financial remuneration of 35 or 75 cents for the pretest and the main experiment, respectively.

3.3 Pretest

Fake products were created to ensure that the stimuli were not familiar. The pretest followed the within subjects design. Twelve bottles of spring water and twelve boxes of facial tissue were rated by 34 participants. The purpose of the pretest was to select three to-be-analysed stimuli for each category. The criterion for inclusion was based on a product image having an attitude score that was not at either extreme in case there would be a ceiling or a floor effect (means ranged from 3.5 to 5.5 on eight-point scales). Attitude towards the brand was measured with four items (positive/negative, like/dislike, good/bad, and desirable/undesirable) on 8-point scales (Crites, Fabrigar, & Petty, 1994). The average of these four items was calculated as attitude towards brand. The mid-point of attitude towards brand was 4.50 on eight-point scales. Participants were instructed to rate the products based on their initial reactions as opposed to more thoughtful or deliberate opinions.

The results of the pretest have been presented in **Appendix 1**.

The stimuli were tested against the mid-point (M = 4.50) of brand attitude. Based on the pretest, the to-be-analysed stimuli chosen for the bottled water category were *bottleblack* [$M_{attitude}$ = 4.66; $t(33)$ = 0.71; p >0.30]; *bottlegreen* [$M_{attitude}$ = 4.08; $t(33)$ = -1.70; p >0.05]; and *bottleyellow* [$M_{attitude}$ = 3.95; $t(33)$ = 2.42; p <0.05]. Except for *bottleyellow*, the mean of each to-be-analysed stimulus was not significantly different from the mid-point of the brand attitude scale. Although *bottleyellow* was rated significantly differently from the mid-point [$M_{attitude}$ = 3.95], the mean was not at either extreme (means ranged from 3.5 to 5.5 on eight-point scales). The to-be-analysed stimuli chosen for the facial tissue category were *tissueheart* [$M_{attitude}$ = 4.61; $t(33)$ = 0.32; p >0.50], *tissuepurple* [$M_{attitude}$ = 4.46; $t(33)$ = -0.14; p >0.50], and *tissueblue* [$M_{attitude}$ = 4.27; $t(33)$ = -0.75; p >0.30]. The mean of each to-be-analysed stimulus of facial tissue was not significantly different from the mid-point of the brand attitude scale.

3.4 Stimuli

In the main experiment, each display contained six products, and of those, two were later rated and also included in the data analysis: the target and one distractor. Participants were also asked to rate two novel (non-appearing) products – one of them was one of the three to-be-analysed stimuli while the other one was not included in the data analysis. In total, eight fake brands of bottled water and eight fake brands of facial tissue were included in the main experiment (see Appendix 4). They were either shown in the visual task or in the questionnaire. The stimuli were chosen for the visual variety of a display. If the display

included various visuals, participants would not respond to the unique target at a glance; they were more likely to use the feature search mode, in which they would tend to examine the visuals serially (Bacon & Egeth, 1994). Therefore, the distractors had the potential to become more distracting. Three bottled water products and three facial tissue products were selected as to-be-analysed stimuli via the pretest. For each category, the three items were used equally often as the target, distractor, or novel stimulus. In the search group, participants were randomly assigned to one of the three different stimulus combinations. For example, one-third of participants received *bottleblack* as the target*, bottlegreen* as the distractor, and *bottleyellow* as the novel stimulus, while another one-third received *bottlegreen* as the target, *bottleyellow* as the distractor, and *bottleblack* as the novel stimulus. The remaining one-third of participants received *bottleyellow* as the target, *bottleblack* as the distractor, and *bottlegreen* as the novel stimulus. Different combinations were used in order to rule out the confounding explanation that the ratings might differ because of specific stimuli.

3.5 Main Experiment

Participants. The main experiment comprised 91 participants: 44 males and 47 females. 9.9% participants were 18–25 years old; 39.6% participants were 26–34 years old; 40.7% were 35–54 years old; 8.8% were 55–64 years old; and 1.1% were 65 or over.

Procedure. The main experiment was a 2 x 2 x 3 mixed design, with task orientation (search vs. browse) as a between-subjects variable and product category (bottled water and facial tissue) and attention type (target vs. distractor vs. novel stimulus) as within-subjects

variables. Because the browse group was not given top-down attention and, therefore, no targets or distractors, the stimuli were all considered as mere-exposed stimuli instead. Participants were randomly assigned to one of the two task-orientation groups. In both groups, 10 different displays were shown (five of bottled water and five of facial tissue). Each display had six products, and the corresponding six spaces were numbered (see Appendix 5). The same six products were used in the displays for the trials of each product category, but the products were placed in different locations. For each display, the page disappeared after 5 seconds. In a study conducted by Hamid (1973), it was found that liking ratings increased through mere-exposure durations of 5 seconds, reached a plateau, and began to decline with longer exposure durations (for example, 15–25 seconds). In the main experiment, participants had 5 seconds to either find out the location of a target product or simply look at the exposed products. Therefore, visuals of all targets, distractors, or merely exposed stimuli repeated 5 times, for 5 seconds per instance so that all water bottles and tissue boxes were exposed to every participant for 25 seconds in total. The participants of the search group were required to find the target brand and note the number of the spaces it appeared after from some shelf displays (see Appendix 6). There were two sets of tasks, one for bottled water and one for facial tissue. For each set, participants were first shown a display on which the target product was circled in red; then four different displays followed. The target appeared in different locations each time. The to-be-analysed distractor was always placed on the right of the target. The instruction was as follows:

Assuming that you are in a store, select the target product from a shelf. Two product categories will be shown: bottled water and facial tissue. You will be shown the target product first, which is circled in red. You need to remember the target product. Then, different shelf placements will follow. For each trial, you will have 5 seconds to find the target product and fill in the number of it.

The participants of the browse group were simply asked to look at exposed products on ten different displays, five of bottled water and five of facial tissue (see Appendix 6). The instruction was as follows:

Assume that you are in a store and need to pick up a product from a shelf. Two product categories will be shown: bottled water and facial tissue. Different shelf placements will follow. For each trial, you will have 5 seconds to view the shelf. There are 10 trials in total. Look at whatever catches your interest. Some related questions will be asked afterwards.

After the visual tasks, participants were asked to finish a questionnaire, in which the measures of this study were included.

The experiment design has been presented in Table 1.

Table 1

	Search Group	**Browse Group**
Products Seen	Bottled Water Facial Tissue	Bottled Water Facial Tissue
Attention Type	Target Distractor Novel Stimulus	Mere-exposed Stimulus 1 (Target in Search Group) Mere-exposed Stimulus 2 (Distractor in Search Group) Novel Stimulus

3.6 Measurement

Emotion responses. In previous mere-exposure research by Monahan, Murphy, and Zajonc (2000), they found that a positive mood could result from mere-repeated exposure, and that there might be a diffused effect of a positive mood, such that participants that saw repeated stimuli tended to rate everything more positively. In the current experiment, emotion responses were measured to check whether task orientation (browse/search) would lead to emotion change and further influence participants' general ratings. Emotion responses were measured using the Self-Assessment Manikin (SAM) with three items on nine-point visual scales (see Appendix 7). The valence of emotion was measured on a scale from positive to negative; the arousal dimension of emotion was measured on a scale from bored, sleepy, and uninterested, to excited, interested, and awake; and the dominance dimension of emotion was measured on a scale of out of control and weak, to in control and dominant (Bradley & Lang, 1994).

Attitude towards brand. Brand attitude was measured with four items on eight-point scales. Following the measurement suggested by Crites et al. (1994), attitude was measured through four pairs of general evaluative terms: positive/negative, like/dislike, good/bad, and desirable/undesirable.

3.7 Results

Emotion responses. An independent-samples test was conducted. In terms of emotion valance (positive/negative), there was no significant difference found between the search

group and browse group [M_{search} = 6.27, M_{browse}= 6.04; $t(89) = 0.57$; $p>0.30$]. For arousal (bored, sleepy, and uninterested/ excited, interested, and awake), no significant difference was found between search group and browse group [M_{search} = 4.89, M_{browse}= 4.85; $t(89) = 0.10$; $p>0.30$]. In terms of dominance (out of control and weak/ in control and dominant), no significant difference was found between the search group and browse group [M_{search} = 5.98, M_{browse}= 5.66; $t(89) = 0.91$; $p>0.30$]. Thus, we can rule out emotions as a potential cause of any differences in ratings.

Attitude towards brand. A 2 x 2 x 3 repeated measures analysis of variance (ANOVA) was conducted, with task orientation (search vs. browse) as a between-subjects variable and product category (bottled water and facial tissue) and attention type (target vs. distractor vs. novel stimulus) as within-subjects variables. There was no main effect of product category [$F(1, 89) = 1.11$; $p>0.15$]. There was no interaction effect of product category and task orientation [$F(1, 89) = 1.24$; $p>0.15$]. No interaction effect of attention type and task orientation was found [$F(2, 178) = 0.29$; $p>0.30$]. No interaction effect of product category and attention type was found [$F(2, 178) = 0.33$; $p>0.30$]. No interaction effect of product category, attention type, and task orientation was found[$F(2, 178) = 0.02$; $p>0.30$)]. Since there was no main effect of product category [$F(1, 89) = 1.11$; $p>0.15$], the bottled water and facial tissue stimuli were combined.

A 2 x 3 repeated measures analysis of variance (ANOVA) was conducted, with task orientation (search vs. browse) as a between-subjects variable and attention type (target vs.

distractor vs. novel stimulus) as a within-subjects variable. Comparison contrasts were conducted.

H1: *Brands will be rated more positively in a mere-exposed situation compared to when they are novel.*

In the browse group, there was no significant difference between mere-exposed stimuli and novel stimuli [$M_{\text{mere-exposed}} = 5.21$, $M_{\text{novel}} = 5.09$;$F(1, 46) = 0.46$; $p > 0.50$]. Hence, **H1** is rejected.

H2: *Brands will be rated more negatively when they are the distractor (not the target), compared to when they are novel, in a goal-directed search.*

In the search group, no significant difference was found between distractors and novel stimuli [$M_{\text{distractor}} = 4.95$, $M_{\text{novel}} = 4.85$; $F(1, 43) = 0.27$; $p > 0.50$]. Hence, **H2** is rejected.

H3: *Brands will be rated more negatively when they are the distractor (not the target) in a goal-directed search compared to when they are in a mere-exposed situation.*

Distractors (stimuli shown in the search group) were not rated significantly lower than when they were in the mere-exposed condition (the same stimuli but shown in the browse group) [$M_{\text{distractor}} = 4.95$, $M_{\text{mere-exposed}} = 5.19$; $F(1, 89) = 0.89$; $p > 0.30$]. Hence, **H3** is rejected.

H4: *Brands will be rated more positively when they are the target compared to when they are novel.*

In the search group, there was no difference between targets and novel stimuli [$M_{\text{target}} = 5.15$, $M_{\text{novel}} = 4.85$; $F(1, 43) = 3.01$; $p > 0.08$]. Hence, **H4** is rejected.

H5: *Brands will be rated more positively when they are the target compared to when they are the distractor (not the target) in a goal-directed search.*

No significant effect was found between targets and distractors [M_{target} = 5.15, $M_{distractor}$ = 4.95; $F(1, 43) = 1.92$; $p>0.15$]. Hence, **H5** is rejected.

H6: *Brands will be rated more positively when they are the target in a goal-directed search compared to when they are in a mere-exposed situation.*

Targets (stimuli shown in the search group) were not rated significantly higher than when they were in the mere-exposed condition (the same stimuli but shown in the browse group) [M_{target} = 5.15, $M_{mere\text{-}exposed}$ = 5.21; $F(1, 89) = 0.06$; $p>0.50$]. Hence, **H6** is rejected.

CHAPTER 4

DISCUSSION

4.1 Discussion and Limitations

In carrying out this research, I assumed that there was a positive relationship between attention and stimulus ratings, and a negative relationship between attentional inhibition and stimulus ratings. It was assumed that the more attention paid to a stimulus, the more positive the effect would be, and the more attention inhibited, the more negative the effect would be. I considered three exposure effects in an affective continuum: distractor devaluation in the lower end, mere exposure in the middle, and target selection in the higher end. Unfortunately, all the hypotheses were rejected. I found that all items were rated similarly, regardless of their role.

There was a difference in brand attitude between targets and novel stimuli at $p = 0.10$ [$M_{target} = 5.15$, $M_{novel} = 4.85$; $F(1, 43) = 3.01$; $p = 0.09$]. The result indicated a positive influence of selective attention on attitude towards an unfamiliar brand. On shelf displays, there are many products that are similar to each other; sometimes, consumers have no time and do not want to make an overall judgment. I was interested in whether the searching activity can lead to positive affect towards the selected brand when people encounter the brand at a later time. Based on the result, the attitude difference between targets and novel stimuli was in the hypothesised direction but was not convincingly significant. A paired-samples *t*-test was conducted with attitude towards all targets (using the average score of bottled water and facial tissue) and attitude towards all novel stimuli as a within-subjects

variable [$t(43) = 1.74$; $p = 0.09$; Cohen's $d = 0.26$]. Cohen suggested that $d \approx 0.20$ be considered as a "small" effect; $d \approx 0.50$ a "medium" effect; and $d \approx 0.80$ a "large" effect. Therefore, $d = 0.26$ actually captured a small positive effect of target selection. Using the difference and the *SD* of the difference between targets and novel stimuli, a power analysis was conducted to determine the expected sample size (Faul et al., 2007). According to the power analysis, 192 participants were required for the search group to detect a possible effect. However, for the current study, only 44 participants from Amazon's Mechanical Turk were included in the search group. Thus, the failure to support the hypotheses of positive target exposure could have resulted from an insufficient sample size.

Additionally, five seconds of exposure was set for each display and for every participant. However, some participants failed to find the target location within five seconds, and especially in the first two trials, correct responses were low. There were eight trials in total, and the accuracy rates have been shown in Table 2.

Table 2
Performance Statistics

Trial	1	2	3	4	5	6	7	8
Accuracy	70.5%	79.5%	90.9%	90.9%	93.2%	100.0%	100.0%	97.7%

If the participants filled in the wrong target location or left the answer blank, it indicated that in that specific trial, the participants did not selectively attend to the target. There was also a chance that a distractor received selective attention by accident. On the other hand, some participants may have found the target in some trials very quickly, and then may have

had a few seconds to look around the shelf display, which made the surrounding distractors less distracting but also gave them the opportunity to catch attention. Therefore, the manipulation of selected attention to the target and attentional inhibition to distractors may not have always been successful in the study. Since I assumed that attentional process was a key factor that could activate different affective responses (positive or negative), a weak manipulation may have resulted in no significant results.

There were six brands shown on each display; however, only the brand on the right of the target was picked as a to-be-analysed distractor. The to-be-analysed distractor may not have received attentional inhibition if a participant looked from the left and found the target without any effort to inhibit the distractor on the right. English-speaking participants read in a predominantly left-to-right manner, and participants may have followed a left-to-right attentional trajectory to search the target (Spalek & Hammad, 2005). The experiment, therefore, may not have successfully manipulated attentional inhibition towards the to-be-analysed distractors, which could also have led to the absence of negative ratings of distractors.

Furthermore, there were debates about whether top-down processing strategies could completely override bottom-up attention (Theeuwes, 2004; Leber & Egeth, 2006). According to Theeuwes (2004), although participants had a visual task in hand, they were not able to fully ignore the task-irrelevant distractors. Leber and Egeth (2006) introduced a training phase in which participants got familiar with the visual task, following which they started the test phase. In contrast to Theeuwes's argument (2004), Leber and Egeth (2006) provided

evidence that attention capture of distractors could be overridden in the test phase. Vatterott and Vecera (2012) suggested that with little experience, attention control is largely stimulus-driven, but the control shifted to goal-driven (top-down) as task templates were learned through experience with visual displays. Therefore, to reinforce the top-down attentional process in the current study, an initial training phase could be included.

In the browse group, no significant mere exposure effect was found. The browse group was asked to view the displays without any purpose. Since it was an online study, without a specific goal, participants may have been more distracted, and they may not have followed the instructions as expected. The displays changed automatically while the participants did not have to do anything. Thus, the chance for online participants to focus on something else was increased (for example, a participant may have had his TV on when doing the task).

The stimuli comprised meaningless patterns, such as lines and circles, as well as meaningful patterns, for example, one tissue box included a heart shape. In the mere-exposure situation, participants may have paid more attention to the meaningful stimuli. Therefore, meaningful stimuli may have received more positive exposure effects. In the situation of distractor devaluation, participants may have exerted more effort to avoid the meaningful stimuli, since the stimuli may have been too salient and too distracting. The meaningful stimuli may have received stronger attentional inhibition, and therefore, more negative exposure effects. I did not pretest the salience of stimuli to grab attention. But in each product category, the three to-be-analysed stimuli were rotated to play the role of target, distractor, or novel product. The same six stimuli (three of bottled water and three of facial

tissue) were used as target, distractor, or novel product. Therefore, the comparison between attention types should not be influenced by the salience of stimuli.

In sum, the current study could be revised in several ways. First, if participants are recruited from Amazon's Mechanical Turk, the sample size should be increased as the power analysis indicated (about 190 participants per group). Second, without timing each display for 5 seconds in the search group, participants should be instructed to finish the task as quickly as possible. Third, to reinforce the top-down attentional process and, therefore, increase the manipulation of inhibition to distractors, an initial training phase should be included. Fourth, all the stimuli surrounding the target should be included as to-be-analysed distractors. Fifth, it may be useful to carry out the study in a laboratory environment to make sure the participants follow the instructions and focus on the study, especially the browse group.

Furthermore, an improved experiment design could be used. A pretest should be conducted to ensure that 1) the stimuli in the main experiment are not familiar to the subjects; 2) the attitude scores of stimuli are not significantly different from each other; and 3) the attitude scores of stimuli are not at either extreme in case there is a ceiling or a floor effect. The main experiment should be a 4 x 1 between-subjects design. Participants should be randomly assigned to one of the four groups. In Group A, participants will find the location of a target brand and rate their attitudes towards the target brands and towards several foil brands later. In Group B, participants will find the location of a target brand and rate the distractor brands and several foil brands later. Group C will ask participants to simply look at the exposed brands without any purpose, and rate the exposed brands and several foil brands

later. Group D will serve as a control group. In Group D, the participants will directly rate their attitudes towards all the stimuli in the three other groups, no matter whether a stimulus appears as a target, a mere-exposed brand, a distractor, or as a foil brand. In Group A, B, C and D, the recognition memory towards the rated brands will be measured.

Planned contrasts in ANOVA will be conducted to compare means. Target ratings in Group A will be compared with distractor ratings in Group B, mere-exposed ratings in Group C, and novel ratings in Group D. In addition, distractor ratings in Group B will be compared with mere-exposed ratings in Group C and novel ratings in Group D. Mere-exposed ratings in Group C will also be compared with novel ratings in Group D.

If it is easier to find a positive effect in target exposure than in mere exposure – it indicates that attention plays a role in preference formation; increased affective response occurs with a higher level of attention. However, there is little mere exposure research examining the relationship between attention and affective response. Little research explained the mere exposure effect from the aspect of attention. If the attentional inhibition is successfully manipulated and distractor devaluation is accordingly found, a uniform framework of the exposure-affect relationship could be based on an attention account. Advertising is often given scattered or inhibited attention, but in order to enhance consumers' preference, it seems strategically important to know in which case consumers will selectively attend to the brand/product.

4.2 Future Research

The current study considered that the primary difference between positive and negative exposures is based on attention or inattention towards visual stimuli. I manipulated attention by setting goals: one goal was to search for the target product and the other was to browse through the displayed products. However, there was no manipulation check to see whether the attention/inattention was manipulated successfully. Pieters and Wedel (2007) examined goal control of attention to advertising using the eye-tracking method to track attention. There are studies (for example, Boronat & Logan, 1997; Joseph, Chun & Nakayama, 1997) that used reaction time to indicate the amount of attention paid to visual stimuli: the quicker the participants respond to a stimulus, the more attention they focus on it. In order to closely examine the relationship between attention and exposure affect, it might be necessary to include eye-tracking or reaction time measures.

The study measured brand attitude as the dependent variable. In terms of exposure effect, it can also be measured as liking, memory, and choice. To understand how attentional processes can influence the downstream cognitive processes, it would be interesting to investigate the relationship between attention/inattention and recognition memory. In the mere exposure literature, compared to recognizable stimuli, exposure to subliminal stimuli resulted in greater attitude enhancement (Bornstein, 1989). Distractor devaluation could also occur in the absence of recognition of to-be-rated stimulus (Martiny-Huenger & Gollwitzer,

2014; Duff & Faber, 2011). However, it remains unknown whether there is a negative correlation between the recognition and ratings of distractors.

Any advertising can be seen as a certain way of exposure. This study examined mere exposure, target selection, and distractor devaluation by introducing an online visual search/browse shopping task. These three types of exposure could also be investigated in other forms. For example, a mobile app of a dictionary can embed an ad on the opening page (the ad might receive the mere exposure effect), or the ad could be placed on the page where users search words for their meaning (the ad may receive the distractor devaluation).

In summary, instead of the old marketing saying that any exposure is good exposure, advertising professionals should pay attention to the development of preferences via exposure, both on the positive and negative side. Although the current study failed to support any hypotheses, the relationship between attention and exposure effect is still worth investigating in order to understand how different exposure effects occur.

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Appendix 1

Pretest Result

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
bottleblack	34	2.50	8.00	4.6618	1.32414
bottlelightgreen	34	1.00	7.00	4.5956	1.39128
bottlelightblue	34	1.00	8.00	5.0882	1.60714
bottledarkblue	34	2.00	8.00	4.9779	1.37396
bottlegrey	34	1.00	8.00	5.3235	1.74787
bottlelightyellow	34	1.00	8.00	4.9412	1.51640
bottlered	34	1.00	8.00	4.9779	1.62761
bottlegreen	34	1.50	6.50	4.0809	1.44038
bottleblackred	34	1.00	7.00	3.6691	1.63846
bottlequan	34	2.00	8.00	5.2721	1.55379
bottleyellow	34	1.00	7.00	3.9485	1.32970
bottlefengquan	34	1.75	8.00	5.2426	1.47001
tissuestar	33	2.00	8.00	5.2955	1.38696
tissuebubble	34	1.75	8.00	5.4044	1.62720
tissueblackred	34	1.00	8.00	4.9559	2.01835
tissueheart	34	1.00	8.00	4.6103	2.00207
tissuepurple	34	1.00	8.00	4.4559	1.83348
tissuebrown	34	1.00	8.00	4.2868	2.00202
tissuecherry	34	1.00	8.00	3.9779	2.10372
tissueblue	34	1.00	7.00	4.2721	1.76816
tissueblack_smile	34	1.00	8.00	4.2647	1.98664
tissuemaple	34	1.00	8.00	4.9412	1.92478
tissuebamboo	34	1.00	8.00	4.8015	1.83276
tissueflower	34	1.50	8.00	5.5221	1.43597
Valid N (listwise)	33				

Appendix 2

Gender and Age

Pretest

Gender:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	13	38.2	38.2	38.2
	Female	21	61.8	61.8	100.0
	Total	34	100.0	100.0	

Main Experiment

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25	9	9.9	9.9	9.9
	26-34	36	39.6	39.6	49.5
	35-54	37	40.7	40.7	90.1
	55-64	8	8.8	8.8	98.9
	65 or over	1	1.1	1.1	100.0
	Total	91	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	44	48.4	48.4	48.4
	Female	47	51.6	51.6	100.0
	Total	91	100.0	100.0	

Appendix 3

Descriptive Statistics of Attention Type

Search Group

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Target_all	44	3.13	7.50	5.1534	1.10623
Distractor_all	44	2.25	7.00	4.9489	1.19723
Novel_all	44	1.75	7.00	4.8551	1.21130
Valid N (listwise)	44				

Browse Group

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Mere_exposed1	47	3.00	7.50	5.2101	1.15159
Mere_exposed2	47	1.50	7.50	5.1888	1.22277
Novel_all	47	3.50	7.25	5.0878	1.12648
Valid N (listwise)	47				

Target_all in the search group was considered as *Mere_exposed1* in the browse group.
Distractor_all in the search group was considered as *Mere_exposed2* in the browse group.

Appendix 4

Stimuli in Main Experiment

Bottled Water

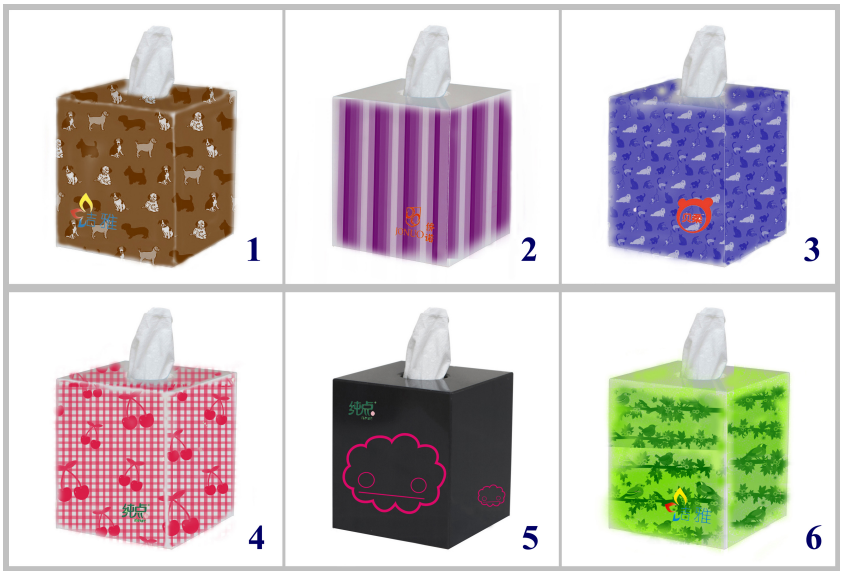
Facial Tissue

Appendix 5

Display Example

Bottled Water

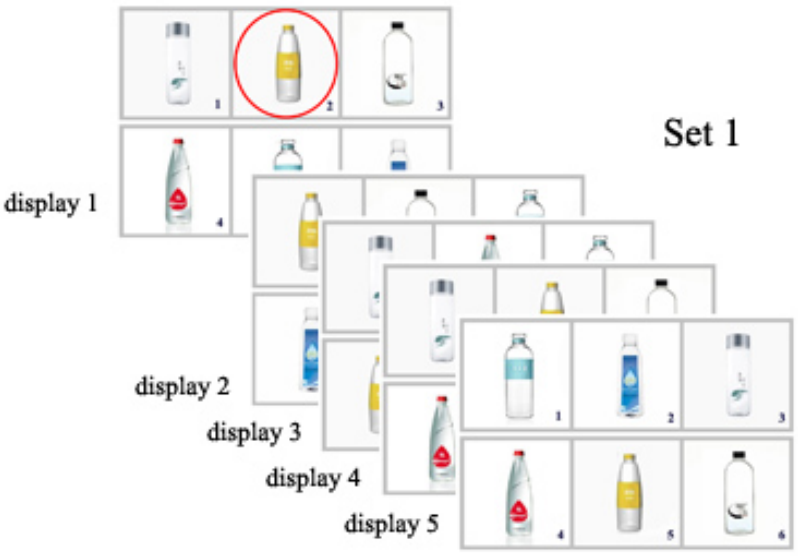
Facial Tissue

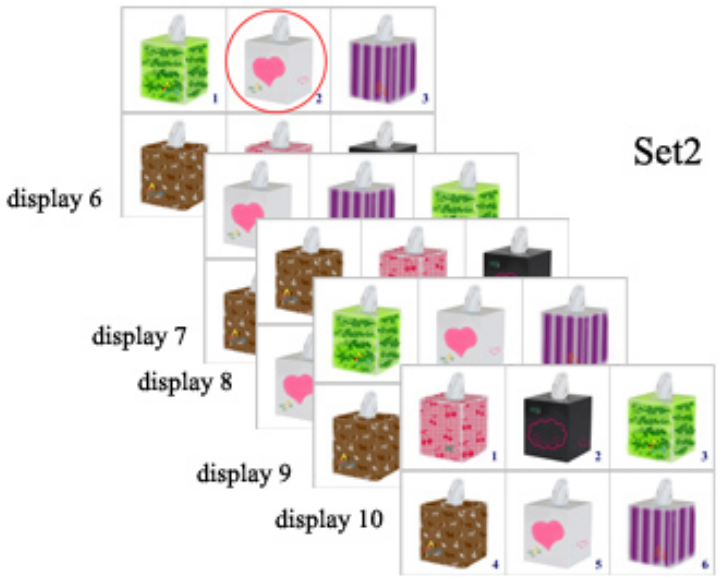


Appendix 6

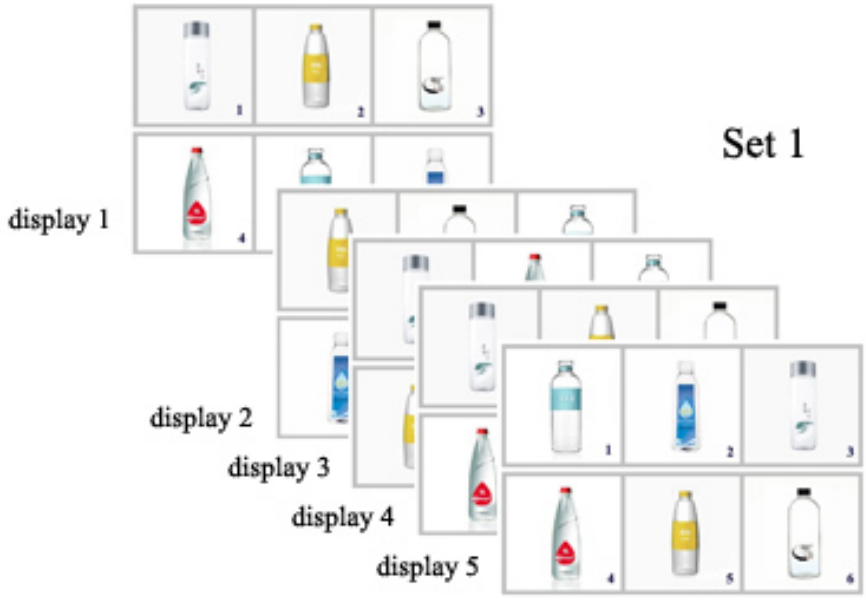
Task Flow

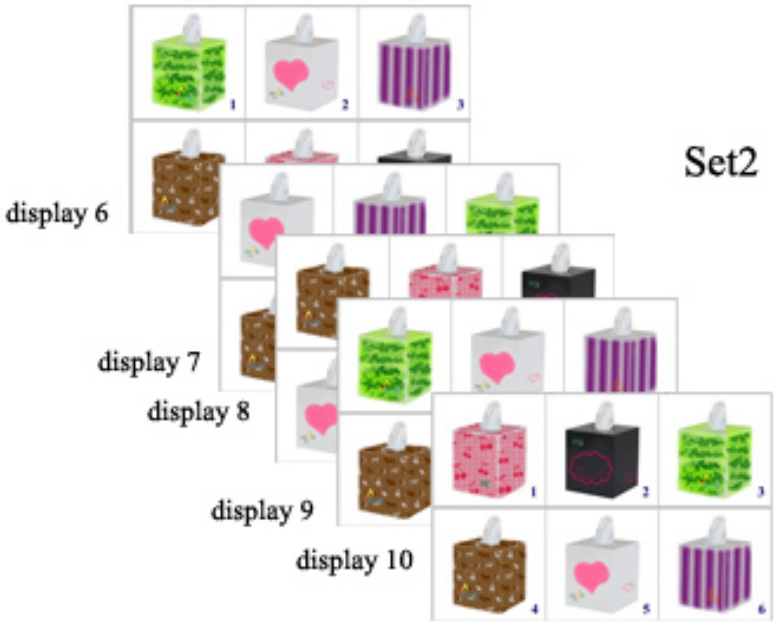
Search Group





Browse Group





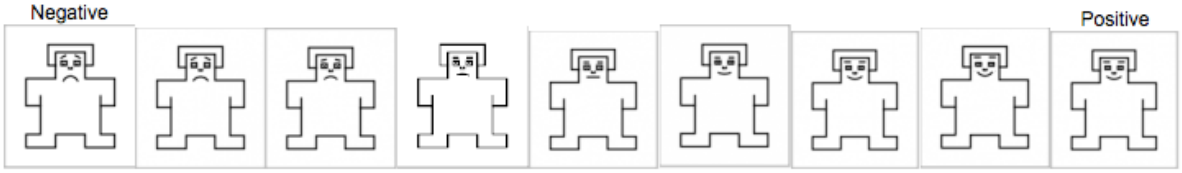
Appendix 7

Questionnaire

Please find and fill in the number of the target product.

Please circle the picture that best corresponds with how you feel right now:

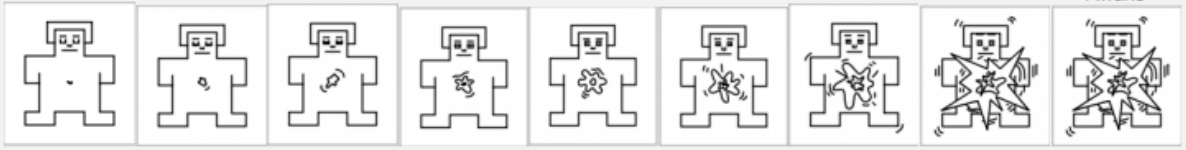
Negative



Positive

Please circle the picture that best corresponds with how you feel right now:

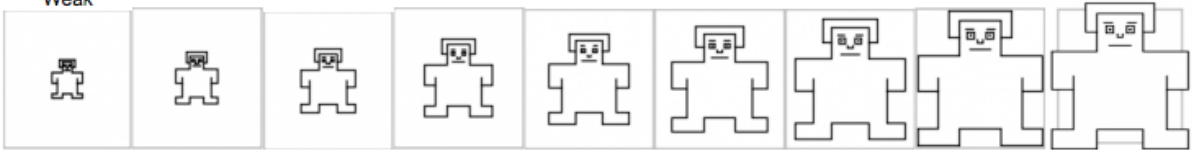
Bored/ Sleepy/ Uninterested



Excited/ Interested/ Awake

Please circle the picture that best corresponds with how you feel right now:

Out of Control/ Weak



In Control/ Dominant

Please check the boxes that best describe your attitude towards the above brand.

Very negative	○ ○ ○ ○ ○ ○ ○ ○	Very positive
Dislike very much	○ ○ ○ ○ ○ ○ ○ ○	Like very much
Very bad	○ ○ ○ ○ ○ ○ ○ ○	Very good
Very undesirable	○ ○ ○ ○ ○ ○ ○ ○	Very desirable

Are you color blind?

- Yes
- No

Do you have normal or corrected to normal (with glasses/ contacts) vision?

- Yes
- No

Gender:

- Male
- Female

How old are you?

- 18-25
- 26-34
- 35-54
- 55-64
- 65 or over